

**From:** Geneva Irwin  
**Subject:** Air Quality Monitoring Weekly Summary - Week Ending in September 9, 2017  
**Date:** September 19, 2017 4:23:00 PM

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Good Afternoon,

**A summary of the Giant Mine ambient air quality monitoring program (AQM) for the week ending September 9, 2017 is as follows:**

**Fenceline Network:**

No 15-minute average particulate matter less than 10 microns in diameter (PM<sub>10</sub>) concentrations above the established Risk Based Action Level (RBAL) of 159 µg/m<sup>3</sup> were measured at the fenceline monitoring stations during the week. PM<sub>10</sub> concentrations measured at most of the fenceline locations during the week were typical of seasonal background concentrations;

A total of twenty-two (22) 15-minute average total suspended particulate (TSP) concentrations above the established RBAL of 333 µg/m<sup>3</sup> were measured at the fenceline monitoring stations on September 3, 2017. Elevated TSP concentrations above typical background concentrations were measured at all fenceline locations during the early morning hours on September 3, 2017. Elevated concentrations appear to be the result of heavy fog observed in the area of the samplers. No site activities that may have contributed to the measured concentrations were reported during this time period;

- o Twenty-two (22) 15-minute average TSP concentrations above the established fenceline RBAL were measured at fenceline monitoring Sites A-North, F-Marina, G-West, H-NW Pond, and I-S Pond on September 3, 2017. The concentrations ranged from 371 µg/m<sup>3</sup> to 784 µg/m<sup>3</sup> and were measured between 00:00 and 05:00 MST. Wind speed during this time ranged from calm winds to 1.8 m/s, with winds moving between the south at midnight to the east-northeast at 05:00 MST, placing Yellowknife upwind from Giant Mine;

Laboratory results for PM<sub>10</sub> analyses from samples collected on August 13, 17, and 18, 2017 indicated concentrations measured above the Ontario 24-Hour Standard for PM<sub>10</sub> (50 µg/m<sup>3</sup>). On August 13, 2017 fenceline sites A-North, D-Beach, E-A1C1, F-Marina, and G-west, were above the standards for PM<sub>10</sub>. On August 17, 2017 PM<sub>10</sub> was measured above the Ontario 24-Hour Standard at I-S Pond. On August 18, 2017 PM<sub>10</sub> was measured above the Ontario 24-Hour Standard at A-North, B-Town, C-Northwest, D-Beach, F-marina, and G-West;

- o On August 13, 2017 the winds were predominately from the south-southeast with an average wind speed of 3.0 m/s placing the City of Yellowknife upwind from Giant Mine. Laboratory analysis of 24-hour integrated PM<sub>10</sub> filter based samples above the Ontario 24-Hour Standard ranged from 82 µg/m<sup>3</sup> to 109 µg/m<sup>3</sup>. Real time PM<sub>10</sub> fenceline concentrations were above the RBAL or elevated at all fenceline monitoring sites throughout the day and community station particulate samplers also measured PM<sub>10</sub> and PM<sub>2.5</sub> measurements in excess of their respective standards. Heavy smoke from nearby regional forest fires was reported on this day. Elevated PM concentrations were likely the result of smoke from forest fires in the area;
- o On August 17, 2017 the winds were predominately from the south-southeast with an average wind speed of 1.8 m/s placing the City of Yellowknife upwind from Giant Mine. Laboratory analysis of the 24-hour integrated PM<sub>10</sub> filter based sample from site I-S Pond was 97 µg/m<sup>3</sup>. On this day real time PM<sub>10</sub> fenceline concentrations were elevated at all fenceline monitoring sites, but not above the RBAL, and community station particulate samplers measured PM<sub>10</sub> and PM<sub>2.5</sub> above seasonal background concentrations but below their respective standards. Elevated PM concentrations were likely the result of smoke from forest fires in the area;

- On August 18, 2017 the winds were predominately from the south-southeast with an average wind speed of 2.0 m/s placing the City of Yellowknife upwind from Giant Mine. Laboratory analysis of 24-hour integrated PM<sub>10</sub> filter based samples above the Ontario 24-Hour Standard ranged from 75 µg/m<sup>3</sup> to 83 µg/m<sup>3</sup>. Real time PM<sub>10</sub> fenceline concentrations were above the RBAL or elevated at all PM<sub>10</sub> fenceline monitoring sites throughout most of the day and community station particulate samplers also measured PM<sub>10</sub> and PM<sub>2.5</sub> in excess of their respective standards. Heavy smoke from nearby regional forest fires was reported on this day. Elevated PM concentrations were likely the result of smoke from forest fires in the area;

Trace metals (including arsenic) analyses for samples collected on August 13, 17 and 18, 2017 were less than the analytical detection limit and/or below the referenced standards. Laboratory results from TSP, PM<sub>10</sub>, and trace metals (including arsenic) samples collected on August 20, 2017 at all fenceline locations were less than the analytical detection limit and/or below the referenced standards. Laboratory analyses of integrated 24-hour trace metals (including arsenic), PM<sub>10</sub>, and TSP filter samples collected by the fenceline samplers after August 20, 2017 are pending.

### **Community Stations:**

No 24-hour average concentrations of PM<sub>2.5</sub> and PM<sub>10</sub> were measured above the referenced standards at the community stations during the week. PM<sub>2.5</sub> and PM<sub>10</sub> concentrations during the week were typically representative of seasonal background concentrations;

Laboratory results for TSP and PM<sub>10</sub>, analyses from samples collected on August 14, 2017 at the YCC, NVN, and NDL community stations were measured above their respective standards; a PM<sub>10</sub> concentration of 159 µg/m<sup>3</sup> and a TSP concentration of 197 µg/m<sup>3</sup> was measured at the YCC station; a PM<sub>10</sub> concentration of 151 µg/m<sup>3</sup> and a TSP concentration of 171 µg/m<sup>3</sup> was measured at the NVN station; and a PM<sub>10</sub> concentration of 156 µg/m<sup>3</sup> and a TSP concentration of 175 µg/m<sup>3</sup> was measured at the NDL station. Laboratory results for trace metals (including arsenic) analyses from samples collected on August 14, 2017 at the community stations were less than the analytical detection limit and/or below the referenced standard;

- On August 14, 2017 the winds were predominately from the south-southeast with an average wind speed of 3.1 m/s placing the City of Yellowknife upwind from Giant Mine. Real time fenceline concentrations were above the PM<sub>10</sub> and TSP RBALs or elevated at all fenceline monitoring sites and community station particulate samplers also measured PM<sub>10</sub> and PM<sub>2.5</sub> measurements in excess of their respective standards. Heavy smoke from nearby regional forest fires was reported on this day. Elevated PM<sub>10</sub> concentrations were likely the result of smoke from forest fires in the area.

Laboratory results for TSP, PM<sub>10</sub>, and trace metals (including arsenic) analyses from samples collected on August 17 and 20, 2017 at the community stations were less than the analytical detection limit and/or below the referenced standard. Laboratory analyses of community station filters collected after August 20, 2017 are pending;

- Laboratory results for asbestos analyses from samples collected on August 17 and 20, 2017 at the community stations were less than the analytical detection limit and/or below the referenced standard. Laboratory analyses of asbestos samples collected at the community stations after August 20, 2017 are pending;
- There were no NO<sub>2</sub> concentrations measured at the recently established Niven Lake community air monitoring station above the NWT Ambient Air Quality 24-Hour Standard of 106 parts per billion (ppb) or the 1-Hour Standard of 213 ppb during the week. Table 1 summarizes the daily hourly maximum concentrations and the daily 24-Hour average concentrations measured at the Niven Lake community station during the week.

Table 1

Niven Lake Community AQM Station NO2 Concentrations

Date	Maximum One-hour Average (ppb)	24-hour Average (ppb)
September 03, 2017	0.7	-0.2
September 04, 2017	0.3	-0.2
September 05, 2017	4.1	0.4
September 06, 2017	1.5	0.4
September 07, 2017	1.3	0.3
September 08, 2017	2.3	0.5
September 09, 2017	0.1	-0.3

**General Operation:**

- The AQM program operated as specified during the week ending September 9, 2017.

Sincerely,

Natalie Plato